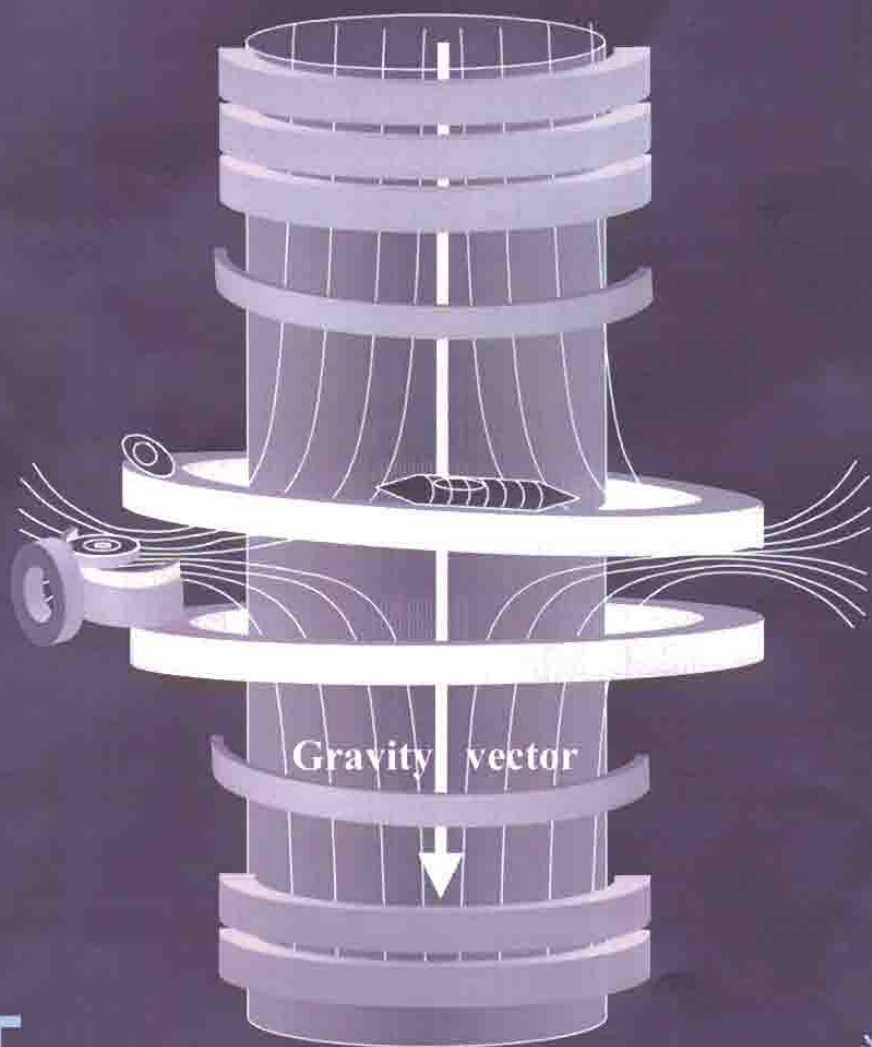


Journal of Research

of the

National Institute of Standards and Technology

January - February 2005, Vol. 110, No. 1 ISSN 1044-677X



NIST

National Institute of Standards and Technology
Technology Administration, U.S. Department of Commerce

Available Online
<http://www.nist.gov/jres>

Journal of Research of the **National Institute of Standards and Technology**

Volume 110

Number 1

January-February 2005

Board of Editors

Theodore V. Vorburger
Chief Editor

Available online

<http://www.nist.gov/jres>

Robert L. Watters, Jr., Technology Services
James K. Olthoff, Electronics and Electrical Engineering Laboratory
Craig M. Shakarji, Manufacturing Engineering Laboratory
Cynthia J. Zeissler, Chemical Science and Technology Laboratory
Joseph P. Rice, Physics Laboratory
Clare M. Allocca, Materials Science and Engineering Laboratory
Nicos S. Martys, Building and Fire Research Laboratory
Alan H. Goldfine, Information Technology Laboratory
Walter S. Liggett, Jr., Information Technology Laboratory
Clifton M. Carey, Paffenbarger Research Center
Barry N. Taylor, Chief Editor Emeritus

Julian M. Ives
Managing Editor, and Technical Production Editor

Ilse E. Putman, Karen J. Wick
Electronic Composition



U.S. Department of Commerce—**Carlos M. Gutierrez**, Secretary
Technology Administration—**Phillip J. Bond**, Under Secretary of Commerce for Technology
National Institute of Standards and Technology—**Hratch G. Semerjian**, Acting Director

Cover: A superconducting solenoid (gray) generates magnetic flux lines that are focused around the center, where one of the induction coils (white) can act as a motor or a generator. When the electromagnetic and gravitational forces are aligned, an absolute power measurement of watt units determines the Planck constant. Cover art arranged by C. Carey.

The *Journal of Research of the National Institute of Standards and Technology*, the flagship periodic publication of the national metrology institute of the United States, features advances in metrology and related fields of physical science, engineering, applied mathematics, statistics, biotechnology, and information technology that reflect the scientific and technical programs of the Institute. The *Journal* publishes papers on instrumentation for making accurate measurements, mathematical models of physical phenomena, including computational models, critical data, calibration techniques, well-characterized reference materials, and quality assurance programs that report the results of current NIST work in these areas. Occasionally, a Special Issue of the *Journal* is devoted to papers on a single topic. Also appearing on occasion are review articles and reports on conferences and workshops sponsored in whole or in part by NIST.

ISSN 1044-677X

Coden: JRITEF

Library of Congress Catalog Card No.: 89-656121

United States Government Printing Office, Washington: 2005

*C*ontents

Available online
<http://www.nist.gov/jres>

Articles

Details of the 1998 Watt Balance Experiment Determining the Planck Constant	Richard Steiner, David Newell, and Edwin Williams	1
Re-Analysis of the Uncertainty of the 0.895 μm Diameter (NIST SRM [®] 1690) and the 0.269 μm Diameter (NIST SRM [®] 1691) Sphere Standards	G. W. Mulholland	27
Slip Correction Measurements of Certified PSL Nanoparticles Using a Nanometer Differential Mobility Analyzer (Nano-DMA) for Knudsen Number From 0.5 to 83	Jung Hyeun Kim, George W. Mulholland, Scott R. Kukuck, and David Y. H. Pui	31
Measurement of Workability of Fresh Concrete Using a Mixing Truck	Sofiane Amziane, Chiara F. Ferraris, and Eric P. Koehler	55
A Survey of Tables of Probability Distributions	Raghu Kacker and Ingram Olkin	67
